MEDICAL PROCEEDINGS

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EDITORIAL · REDAKSIONEEL

ORAL (EXPIRED AIR) RESUSCITATION

MONDELINGE (UITGEASEMDE LUG) RESUSSITASIE

> And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life and man became a living soul.
>
> *Genesis*, 2, 7.

> En die Here God het die mens geformeer uit die stof van die aarde en in sy neus geblaas die asem van die lewe. So het dan die mens 'n lewende siel geword.
>
> *Genesis* 2, 7.

Elsewhere in this issue Prof. O. V. S. Kok (Head of the Department of Anaesthetics of the University of Pretoria) surveys very lucidly and comprehensively the most effective as well as the most physiological method of artificial respiration known to us.

The simplicity of the technique involved in resuscitating those in whom breathing is failing or has failed, by blowing life-giving air into the respiratory tract of the victim, was appreciated in biblical times, if not earlier. When the prophet Elisha was faced with such a respiratory emergency, his resuscitation technique was described as follows:

> And he went up, and lay upon the child, and put his mouth upon his mouth . . . and the flesh of the child waxed warm. (II, *Kings*, 4, 34).

With the passage of time this efficient oral method was neglected and forgotten. Ineffective techniques were relied upon and survived for many decades, because they became invested with an aura of scientific authority.

'n Baie duidelike en omvattende oorsig van die doeltreffendste sowel as die mees fisiologiese metode van kunsmatige asemhaling, opgestel deur prof. O. V. S. Kok (hoof van die Anestetiese Afdeling aan die Universiteit van Pretoria) verskyn elders in hierdie uitgawe.

Die eenvoud van die tegniek vir die herstel van die bewussyn van diegene wie se asemhaling dreig om tot stilstand te kom of reeds tot stilstand gekom het deur lewegewende lug in die asemhalingsweë van die slagoffer in te blaas, is reeds in Bybelse dae, en miskien ook vroeër, besef. Die profeet Elisa het by een geleentheid voor so 'n asemhalingsnoodgeval te staan gekom, en sy tegniek van resussitasie word soos volg beskryf:

> Daarna klim hy op en gaan lê op die kind en sit sy mond op dié se mond . . . en die vlees van die kind het warm geword. (II *Konings*, 4, 34).

Met verloop van tyd is hierdie doeltreffende mondelinge metode in so 'n mate veronagsaam dat dit in die vergetelheid geraak het. In plaas

Mouth-to-nose resuscitation should to-day take priority over all other techniques of artificial respiration. The second (very close) place is taken by the mouth-to-mouth technique and if there are any aesthetic objections, these are easily disposed of by the use of a simple cover, e.g. a handkerchief placed between the victim and the resuscitator.

The method is so easy that it can be taught to young school children. There is no need for any technical instruction in First Aid, although some conception of the principles involved (preferably with the aid of a model) is desirable. There seems to be no reason why this technique of resuscitation should not become an integral and standard part of the training of the whole community—an objective easily attained by introducing the teaching of this method as a standard part of the school curriculum.

The scope of the application of the oral techniques of artificial respiration extends far beyond the common indication of asphyxia, as in drowning. It may find a place in industry, in the course of applying electroconvulsive therapy, electric shock, lightning, poisoning by gases, head injuries, etc. The great number of conditions in which this technique of resuscitation may have to be applied, both at work and at play, emphasizes the importance of universal training in these methods.

The contra-indications are limited and do not disturb the need for this technique to be part of the general knowledge and skill of every member of the community.

As pointed out by Professor Kok, oral resuscitation has won wide support throughout many countries, ranging from the U.S.S.R. to the U.S.A. and almost without exception is recommended as the method of choice in First Aid training.

It is interesting that experience with this method stresses the need to begin oral resuscitation in a case of drowning even before the body has been removed from the water and while the victim is still on his back. This suggests that in some quarters the mechanical role of water in the respiratory tract has been grossly over-estimated as a cause of asphyxia. The development of acute pulmonary oedema is in part due to the very drastic and rapid changes occurring across the alveolar capillary membrane. This frothy oedema may also be due in part to a superimposed heart failure. The method of resuscitation applied by Elisha may well cause us to revise our concepts of the pathology of drowning.

daarvan is daar staatgemaak op ondoelmatige tegnieke wat baie jare lank in swang gebly het omdat daar 'n aura van wetenskaplike gesag aan hulle vasgekleef het.

Resussitasie deur die toepassing van die mond-tot-neus-tegniek behoort vandag die plek van alle ander kunsmatige asemhalingsmetodes in te neem. Tweede plek (baie kort op die hakke van die eerste) word ingeneem deur die mond-tot-mond-metode, en as daar enige estetiese besware hierteen is, kan hulle maklik uit die weg geruim word deur die gebruik van 'n eenvoudige bedekking, bv. 'n sakdoek wat tussen die slagoffer en die lewensredder geplaas word.

Die metode is so maklik dat jong skoolkinders daarin onderrig kan word. Tegniese instruksie in Noodhulp is glad nie nodig nie, hoewel 'n begrip van die beginsels wat by die saak betrokke is (liefs met behulp van 'n model) wenslik is. Daar skyn geen rede te wees waarom hierdie tegniek van resussitasie nie 'n integrerende en standaard-deel van die opleiding van die hele gemeenskap gemaak kan word nie—'n doel wat ons maklik kan bereik deur die onderrig van hierdie metode 'n standaard-deel van die skoolleerplan te maak.

Die toepassingsbestek van die mondelinge tegniek van kunsmatige asemhaling strek veel verder as die gewone indikasie van asfiksie, bv. wanneer 'n persoon verdrink het. Dit kan 'n plek in ons nywerhede verwerf, by die toepassing van elektrokonvulsiewe terapie, in gevalle van elektriese skok, waar 'n persoon deur weerlig getref is, en in gevalle van gasvergiftiging, kopbeserings, ens. Die groot aantal toestande waar hierdie tegniek sowel by die werk as op die speel terrein toegepas kan word, beklemtoon die belangrikheid van universele opleiding in hierdie metode.

Die kontra-indikasies is beperk, en doen geen afbreuk aan die noodsaaklikheid daarvan om hierdie tegniek 'n deel van die algemene kennis en bekwaamheid van elke lid van die gemeenskap te maak nie.

Soos professor Kok heeltemal tereg daarop wys, het mondelinge resussitasie wydverspreide steun in talle lande verwerf—vanaf Sowjet-Rusland tot die Verenigde State—en byna sonder uitsondering word dit as die verkieslikste metode vir Noodhulponderrig aanbeveel.

Dit is interessant dat die ondervinding wat met hierdie metode opgedoen is, klem laat val op die noodsaaklikheid om in 'n geval van verdrinking met mondelinge resussitasie te

CLOSED CHEST CARDIAC MASSAGE

In the second part of his paper, Professor Kok surveys a relatively new contribution to the technique of cardiac resuscitation, viz. closed chest cardiac massage. There is a sound basis in experimental animal work for this method of external cardiac massage as effective in maintaining the circulation without the need to open the chest. The application of this technique is limited, partly by the great difficulty which is often experienced in differentiating true cardiac arrest from severe hypotension. There are also dangers that vigorous application of the technique may produce mediastinal haemorrhage, fractured ribs and liver laceration. The technique is clearly one which is not suitable for laymen and has a limited application even in the case of professional rescuers. There is a great risk that there may be an excessive concentration on external cardiac massage, with the result that the importance of restoring respiration is overlooked.

The technique should only be used by those with a sufficient medical training. It is of value for a very limited period and can only be continued if the pulse is palpable. An ECG tracing must be taken immediately and an external defibrillator should be at hand. Unless the response to external massage or external defibrillation is fairly prompt, surgical exposure must be undertaken and the conventional method of cardiac massage must be applied.

The technique has a limited field in the consulting rooms of doctors and dentists, in hospital wards if no other equipment is available and on the sports field, if a doctor is present.

Medical practitioners should certainly be aware of the value of this auxiliary aid to the techniques of resuscitation. This is desirable not only for proper clinical practice but also to place this measure in its proper perspective if it should ever acquire medico-legal importance in any judicial inquiry.

FILMS AVAILABLE

The Department of Anaesthesia at the University of Pretoria has prepared an excellent colour film (with a commentary available in either English or Afrikaans) illustrating very clearly and dramatically the principles and the simplicity of the technique of oral methods of artificial respiration. Much of the acting is done by young children, thus emphasizing the ease of the method and the importance of begin selfs voordat die slagoffer uit die water gehaal is en solank hy nog op sy rug lê. Dit suggereer dat sommige kringe glad te veel waarde geheg het aan die meganiese rol van water in die asemhalingsweë as 'n oorsaak van asfiksie. Die ontwikkeling van akute pulmonale edeem moet gedeeltelik toegeskryf word aan die baie drastiese en vinnige veranderings wat oor die alveolêre kapillêre vlies plaasvind. Hierdie skuimerige edeem kan miskien gedeeltelik ook gewyt word aan 'n bykomende hartversaking. Die resussitasiemetode wat deur Elisa toegepas is; kan ons bes moontlik nog dwing om ons begrip van die patologie van verdrinking in hersiening te neem.

GESLOTE-BORSKAS-HARTMASSERING

In die tweede deel van sy referaat verstrek prof. Kok 'n oorsig van 'n betreklik nuwe bydrae tot die tegniek van hart-resussitasie, nl. geslote-borskas-hartmassering. In proefondervindelike werk met diere is goeie gronde gevind vir hierdie metode van uitwendige hartmassering as 'n doeltreffende manier om die bloedsomloop in stand te hou, sonder dat dit nodig is om die borskas oop te maak. Die toepassing van die tegniek is egter beperk, gedeeltelik weens die moeilikheid wat dikwels ondervind word om tussen ware hartstilstand en ernstige hipotensie te onderskei. Daar is ook die gevaar dat die kragdadige toepassing van die tegniek middelvliesbloeding, gebreekte ribbes en lewerverskeuring tot gevolg kan hê. Dis 'n tegniek wat heel duidelik nie vir die leek geskik is nie, en die toepassing daarvan is beperk selfs in die geval van professionele lewensredders. Daar is ook die baie wesenlike gevaar dat 'n mens soveel aandag aan uitwendige hartmassering kan bestee dat jy die belangrikheid daarvan om die asemhaling te herstel geheel en al oor die hoof sien.

Die tegniek behoort dus alleen toegepas te word deur diegene wat voldoende mediese opleiding gehad het. Dit is van waarde slegs gedurende 'n baie kort tydperk en dit kan voortgesit word slegs as die pols voelbaar is. 'n EKG-grafiek moet dadelik geneem word en 'n uitwendige defibrillator behoort byderhand te wees. Tensy daar 'n betreklik vinnige reaksie op uitwendige massering of uitwendige defibrillasie is, behoort chirurgiese blootlegging onderneem en die konvensionele metode van hartmassering toegepas te word.

Die tegniek het 'n beperkte toepassingsbestek in die spreekkamers van dokters en tandartse, in hospitaalsale as geen ander toerusting byderhand is nie, en op die sportveld as 'n dokter aanwesig is.

Mediese praktisyns behoort beslis op hoogte te wees van die waarde van hierdie hulpmaatreël om die tegniek van resussitasie aan te vul. Dit is wenslik nie alleen vir behoorlike kliniese toepassing nie, maar ook om hierdie metode in die regte perspektief te stel as dit ooit van regsgeneeskundige belang in enige geregtelike ondersoek word.

BESKIKBARE ROLPRENTE

Die Departement Anestesiologie van die Universiteit van Pretoria het 'n voortreflike kleurrolprent laat maak (met kommentaar òf in Afrikaans òf Engels) om die beginsels en die eenvoud van die mondelinge

beginning to teach it even to young school children.

Professor Kok also draws attention to an excellent film produced by the Smith, Kline and French Laboratories on *External Cardiac Massage* which may be borrowed by members of the medical profession from this Company.

Thus adequate instructional media are now available to ensure rapid education of the whole population in a simple and effective way of saving life.

metodes van kunsmatige asemhaling baie duidelik en dramaties toe te lig. Baie van die rolle word deur kinders vertolk, en klem word dus gelê op die eenvoud van die metode en die belangrikheid daarvan om selfs jong skoolkinders daarin te onderrig.

Professor Kok vestig die aandag ook op 'n eersteklas rolprent getiteld *External Cardiac Massage* wat deur Smith Kline & French Laboratories verfilm is en deur lede van die mediese professie van hierdie maatskappy geleen kan word.

Doeltreffende onderrigmedia is dus reeds verkrygbaar om ons hele bevolking in te lig oor 'n eenvoudige en doeltreffende manier om menselewens te red.

THE SMITH KLINE AND FRENCH COLOUR TELEVISION UNIT IN SOUTH AFRICA

One of the memorable events in medical communication is the visit of the Smith Kline and French Colour Television Unit to South Africa.

This Unit was established in 1957 in the United Kingdom and has repeatedly televised clinical programmes to medical audiences. It has established a permanent niche for itself in medical demonstrations in the U.K. and its value as a teaching technique (for undergraduate and post-graduate audiences) will now be demonstrated to the medical profession in South Africa.

One of the characteristics of television that most distinguishes it from other methods of visual transmission is its immediacy. The viewer knows that the event being watched is *happening* at that moment. At any instant the unexpected may arise and must be dealt with then and there. This quality is peculiar to television and commands the attention in a way seldom possible with other media.

Many subjects are best taught by direct demonstration because in these the essence of learning is to observe how skill and experience deal with genuine and unforeseen problems that call for quick solution.

SURGICAL AND CLINICAL DEMONSTRATIONS

Surgery has always been taught by direct demonstration. Generations of surgeons have developed their art by observing how a practised senior approaches the predicament disclosed by his first incision. They see how the experienced surgeon contends with the unexpected emergency.

The advantages of television in overcoming the difficulties involved are obvious. The

DIE KLEURBEELDRADIO-EENHEID VAN SMITH KLINE & FRENCH IN SUID-AFRIKA

Die besoek wat die Kleurbeeldradio-eenheid van Smith Kline & French aan Suid-Afrika aflê, is inderdaad 'n gedenkwaardige gebeurtenis op die gebied van mediese kommunikasie.

Hierdie Eenheid is in 1957 in die Verenigde Koninkryk opgerig, en het reeds keer op keer gesorg vir die beeldradio-uitsending van kliniese programme vir mediese gehore. Vir sover dit mediese demonstrasies in die Verenigde Koninkryk betref, het die Eenheid 'n vaste plek vir homself verower, en sy waarde as onderrighulpmiddel (vir ongegradueerdes sowel as na-gegradueerdes) sal nou aan die mediese professie in Suid-Afrika gedemonstreer word.

Een van die kenmerke van beeldradio wat dit veral van ander visuele transmissiemetodes onderskei, is die onmiddellikheid daarvan. Die persoon weet dat die voorval waarna hy kyk, op daardie besondere oomblik *plaasvind*. Die onverwagte kan te enige oomblik gebeur, en sal daar en dan die hoof gebied moet word. Hierdie hoedanigheid is eie aan beeldradio, en boei die aandag op 'n wyse wat selde met ander media moontlik is.

Regstreekse demonstrasie is die beste manier om talle onderwerpe te doseer, want, vir sover dit hierdie onderwerpe betref, is die wese van onderrig eintlik die aanskouing van hoe die egte en onvoorspelbare probleme wat vinnige oplossing vereis, deur vaardigheid en ondervinding die hoof gebied word.

CHIRURGIESE EN KLINIESE DEMONSTRASIES

Chirurgie word nog altyd deur regstreekse demonstrasie gedoseer. Geslagte van chirurge het hul kuns ontwikkel deur te aanskou hoe 'n geoefende senior die probleem wat deur sy eerste insnyding aan die lig gebring word,

camera can transmit to the screen an image that seems to be taken from the surgeon's vantage point. There are no visual limits for the observers and the surgeon can teach with the assurance that his work is being seen. The techniques of presentation to an audience are limited only by the ingenuity of the technicians. Close-ups, panoramic scanning, etc. give the viewer better information than he could ever obtain in real life. Every onlooker is at the demonstrator's elbow. A small microphone under his gown permits the surgeon to be clearly heard.

Medicine, too, has been taught from time immemorial by direct demonstration. While the value of colour television in showing an unrepeatable situation like a surgical operation is especially obvious, the purely medical demonstrations have opened many eyes to the possibility of television's future exploitation in this field. Medical demonstrations are complicated: the patient's demeanour, the individual signs and symptoms of his disease, diagrams, microscope slides, X-ray equipment, can all be brought to the screen at a moment's notice.

Demonstrations have included extremely varied subjects such as the diagnosis and treatment of skin disorders and the study of gait. The quality of immediacy unique to television is a most helpful and effective medium for demonstration and teaching.

The Smith Kline and French Unit will make its debut at the Medical Congress in Cape Town next month. It will also televise programmes in Durban and Johannesburg. This should give most medical practitioners in the country an excellent opportunity of participating in the interesting clinical programmes which are being planned. The Smith Kline and French Organization is to be congratulated on making this interesting instructional medium available to the profession in this country.*

Hulle sien hoe 'n ervare chirurg te werk gaan as hy skielik voor 'n onverwagte noodgeval te staan kom.

Die voordele van beeldradio om die moeilikhede wat hierby betrokke is, te bowe te kom, hoef skaars beklemtoon te word. 'n Beeld soos oënskynlik aanskou vanaf die chirurg se gunstige posisie kan deur die kamera op 'n doek gewerp word. Vir die waarnemer is daar geen visuele beperkinge nie, en die chirurg kan onderrig gee met die absolute sekerheid dat sy werk gesien word. Die aanbiedingstegnieke vir sover dit die toeskouers betref, word beperk alleen deur die vindingrykheid van die tegnici. Opnames van naby geneem, panoramiese beelde, ens., gee die toeskouer veel beter inligting as wat hy ooit in die werklike lewe kan verkry. Iedere toeskouer staan as 'n ware by die elmboog van die demonstrateur. 'n Klein mikrofoon onder sy jurk maak dit moontlik vir die chirurg om sy stem duidelik te laat hoor.

Ook geneeskunde word sedert onheuglike tye deur middel van regstreekse demonstrasie gedoseer. Terwyl die waarde van beeldradio in kleur by die toeligting van 'n onherhaalbare toestand soos 'n chirurgiese operasie veral voor die hand lê, het suiwer mediese demonstrasies talle oë ontsluit vir die moontlike toekomstige eksploitasie van beeldradio op hierdie besondere gebied. Mediese demonstrasies is ingewikkeld: die pasiënt se houding, die individuele tekens en simptome van die siekte, tekeninge, mikroskoopplaatjies, X-straaltoerusting kan almal sonder die geringste versuim op 'n doek gewerp word.

Buitengewoon uiteenlopende onderwerpe vanaf die diagnose en behandeling van velkwale tot die bestudering van 'n persoon se gang is reeds op hierdie manier gedemonstreer. Die hoedanigheid van onmiddellikheid wat, soos ons reeds gesê het, 'n unieke kenmerk van beeldradio is, is 'n besonder hulpvaardige en doeltreffende medium vir demonstrasie- en onderrigdoeleindes.

Die Eenheid van Smith Kline & French maak sy buiging op die Mediese Kongres aanstaande maand in Kaapstad. Beeldradio-programme sal ook in Durban en Johannesburg aangebied word. Dit sal die meeste mediese praktisyns in die land 'n voortreflike geleentheid gee om deel te neem aan die interessante kliniese programme wat beplan word. Die Smith Kline & French-organisasie moet gelukgewens word met die feit dat hy hierdie interessante instruksiemedium tot beskikking van die professie in hierdie land stel.*

ABSTRACT

PREDNISONE AND NITROGEN MUSTARDS IN THE TREATMENT OF HODGKIN'S DISEASE

Four patients with Hodgkin's disease received combined treatment with prednisone and nitrogen mustard. Two responded favourably, whilst the result was doubtful in one and unfavourable in the fourth patient.

[Redondo, P. and Borrasca, A. L. (1957): Med. Clin., **28**, 15.]

* A complete list of the colour television programmes to be televised by The Smith Kline and French Unit in South Africa is printed elsewhere in this issue.

* 'n Volledige lys van die beeldradioprogramme in kleur wat deur die Eenheid van Smith Kline & French in Suid-Afrika aangebied sal word, verskyn elders in hierdie uitgawe.

ORAL RESUSCITATION

AND

CLOSED CHEST CARDIAC MASSAGE*

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'Mouth-to-Mouth Breathing,' 'Mouth-to-Mouth Insufflation,' 'Expired Air Inflation,' and 'Rescue Breathing' are all different names for the same procedure now commonly known as oral resuscitation.

'Oral Resuscitation' means the use of the rescuer's expired air to resuscitate victims who are apparently dead, or who are in respiratory distress as a result of asphyxia or other causes.

There is nothing new in the use of expired air to assist respiration. This method was first described in the Bible. In the 2nd Book of *Kings,* Chapter 4, verse 34, one reads that Elisha 'placed his mouth upon the mouth of the child . . . and his flesh grew warm.'

By this method a miner's life was saved by an English surgeon, Dr. William Tossach, in 1743. The miner had just been brought up from a smoke-filled mine and no pulse was detectable. Dr. Tossach blocked his patient's nose, and did mouth-to-mouth breathing 4 times, after which a pulse became palpable; after he had continued for another 4 minutes, the miner commenced breathing.[1]

In 1950 the American Army sponsored a research programme on the First Aid treatment of nerve gas casualties. After extensive investigations, mainly by anaesthetists of the State of New York, the oldest and most effective method of artificial respiration was re-evaluated and recommended for universal adoption.

In March 1957 the National Academy of Sciences, National Research Council, U.S.A., appointed an *ad hoc* committee to consider new evidence on manual methods of artificial respiration. Amongst other findings the committee was unanimously of opinion that the 'mouth-to-mouth' method for infants and small children was preferable to the rocking method, back-pressure arm-lift, and other manual methods. 'The evidence that the latter methods may fail to move enough air was convincing.'[2]

In recent years such anaesthetists as Virginia Apgar, James Elam and Peter Safar from the U.S.A., Henning Ruben from Denmark and Arne Ruben from Sweden, after extensive researches and experiments on volunteers, have all come to the same conclusion and have demonstrated the superiority of the oral methods of resuscitation over the old and almost discarded manual methods.

To-day, anaesthetists all over the world (including the Executive Committee of the South African Society of Anaesthetists) recommend the oral method of artificial respiration as the first choice for rendering *First Aid* to victims in respiratory distress. *It must be stressed that in these cases the First Aid is being rendered by rescue workers and not by doctors with ample apparatus available.*

TECHNIQUES OF ORAL RESUSCITATION

In a discussion on oral resuscitation 3 different techniques must be considered:

1. Mouth-to-Nose Breathing.
2. Mouth-to-Mouth Breathing.
3. Mouth-to-Airway Resuscitation.

MOUTH-TO-NOSE BREATHING

This is regarded as a first choice by most authors and is also the technique recommended by our Department of Anaesthetics. This method has been accepted as a first choice in Denmark, Switzerland, New Zealand, Austria, Germany and the USSR.[3]

The reasons for preferring this method are as follows:

1. The nose acts as a nozzle, thus reducing the air pressure and preventing air from going into the stomach.
2. In asphyxiated patients it is often difficult to open the mouth.[4]
3. It is much easier to get an airtight fit around the nose than around the mouth.
4. Children can blow into an adult's nose but cannot always completely seal the mouth.[3]

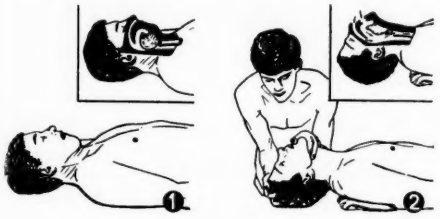
Reports from Denmark, Sweden and Australia indicate that only 3% of the population suffer from obstructed noses. In cases of nasal obstruction it is quite easy to adopt the alternate method, viz. mouth-to-mouth breathing.

Mouth-to-nose breathing is very easy to demonstrate and even children can learn the method after a few lessons.

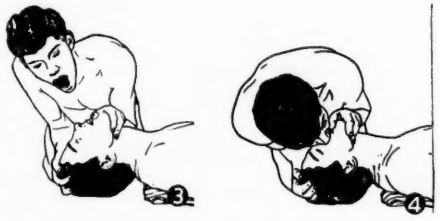
* Paper read at a meeting of the Mine Medical Officers Association, Johannesburg, 1 June 1961.

i. Place the victim on his back. Now lift the neck, grasp the head at the vertex, and extend the head fully. The extension should be sufficient to hold the subject's mouth open by stretching the anterior muscles of the neck (hyper-extension of the head).

ii. Pull the victim's chin upwards so as to close his mouth (Figs. 1, 2).[4]



The victim may now breathe on his own but, failing this, the rescuer keeps his hands as illustrated in Fig. 1, then takes a deep breath (*twice the normal inhalation*), opens his mouth wide and seals his lips around the nose and cheeks of the victim (Figs. 3, 4). The rescuer blows until the chest is seen to rise; he then removes his mouth and listens to the patient breathing out through his mouth and nose. At the same time he takes in another deep breath (Fig. 3).

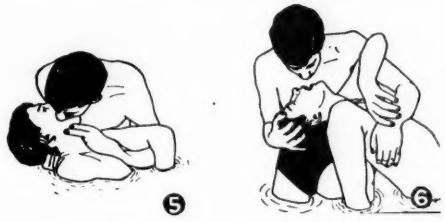


If there is no movement of the chest after the first inflation, the nose may be blocked or there may be an obstruction of the airway. The throat is cleared quickly with the finger, then mouth-to-nose breathing or, if necessary, mouth-to-mouth breathing is continued.

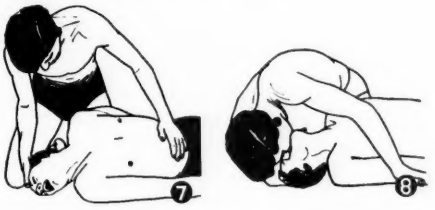
A slap between the shoulder blades, especially in children, may dislodge a foreign body in the airway.

The first 20 breaths should be deep and rapid—at least 20 per minute. After this the rescuer must continue inflations at least 10 times per minute. When the victim commences breathing and his respirations are feeble, he should be assisted by co-ordination of the rescuer's expirations with the victim's inspirations.

In cases of drowning one should always attempt mouth-to-nose resuscitation as soon as possible. No time must be wasted in getting the victim on to dry ground. The moment his head is out of the water, rescue breathing should be started immediately as only a few seconds' delay may mean the difference between life and death.



There is no need to worry about water in the stomach until the lungs have been inflated with life-saving air. Once on land, the victim is placed on his back with his head low. His throat is cleared of water or vomitus by turning his head on one side and pressing gently on his stomach. Then inflation of his lungs is continued as before (Figs. 5-8).



Why is speed so essential in victims apparently dead from drowning? The reason is that after immersion in water death can take place very rapidly. Although respiratory arrest usually precedes cardiac arrest, the interval is very short and artificial respiration would be life-saving only during this period. *This interval is often less than 30 seconds.*[5]

Death from drowning usually occurs more rapidly in fresh water than in sea water. After the aspiration of fresh water into the lungs, rapid absorption takes place across the alveolar capillary membrane. The result is a large scale haemolysis and an electrolyte imbalance with a release of potassium from the erythrocytes. These changes in blood chemistry, together with the superimposed anoxia, rapidly causes ventricular fibrillation. In life-saving one should, therefore, not attempt to hit the struggling victim or hold his nose in order to make him 'choke,' as this would increase the

absorption of fluid through the alveoli. After recovery, the administration of large quantities of liquid should also be avoided.[5]

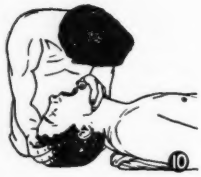
Death from drowning is a common occurrence in South Africa. In the U.S.A. it is third on the list as a cause of fatal accidents. The death rate from drowning in Great Britain is over 1,000 per annum. A third of these are children under the age of 15 years.[5]

It is therefore essential that every school-going child should know how to apply oral resuscitation when faced with such an emergency.

MOUTH-TO-MOUTH BREATHING

An alternative method, to be used only when the nose is blocked, is resuscitation by means of mouth-to-mouth breathing.

9



10

Here the same technique is adopted as already explained in mouth-to-nose resuscitation, but instead of sealing the nose, the rescuer seals his lips around the open mouth of the victim and blocks his nostrils with his cheeks (Figs. 9, 10). Insufflation of air is continued at the same speed as before.

11

12

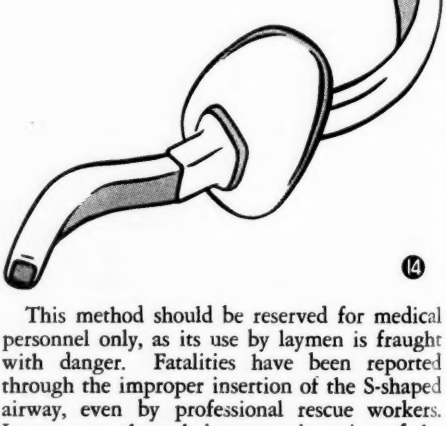
In infants and small children the same technique is adopted and here, after hyperextension of the head, the rescuer's mouth is placed over the child's *mouth and nose* and the child is inflated very gently. In infants one should only use puffs of air from the cheeks. Blowing is stopped as soon as the chest starts to rise, and inflation is continued at the rate of at least 20 times per minute.

Too forceful breathing may result in air being blown into the stomach. This will cause bulging of the epigastrium. This can be removed by gentle pressure in the substernal area (Figs. 11-13).

13

MOUTH-TO-AIRWAY RESPIRATION

In this method, 2 plastic airways are fused together and one end is put in the victim's throat along the curve of the tongue without pushing the tongue backwards. The head is extended, the nostrils and corners of the mouth closed and air is blown in through the other end of the double airway (Fig. 14).



14

This method should be reserved for medical personnel only, as its use by laymen is fraught with danger. Fatalities have been reported through the improper insertion of the S-shaped airway, even by professional rescue workers. In one case, through improper insertion of the airway, the tongue was pushed back in the mouth; in another case the airway itself occluded the base of the tongue so that obstruction of the airway took place. Both patients succumbed.[6]

Other objections are:

1. Difficulty of inserting the airway in cases of trismus of the jaw.
2. Valuable seconds are lost in inserting the airway properly.
3. The danger of causing vomiting and pulmonary aspiration.
4. The non-availability of the apparatus when it is most needed.

ADVANTAGES OF ORAL METHODS OF RESUSCITATION[7]

1. No special equipment is necessary; in fact, the rescuer carries his own bellows.
2. The rescuer can get oxygen into the victim's lungs much faster than by any other known emergency method of artificial respiration.
3. The rescuer can continue for hours without exhaustion and a small rescuer can breathe for a large victim.
4. Rescue breathing can be started immediately and continued whilst the victim is being moved from the site of the accident.
5. The rescuer can see, hear and feel the effect of each inflation.
6. The rescuer's hands are free to ensure an open air passage.
7. *The tidal volumes, levels of carbon dioxide and oxygen in the subject's blood as well as that of the operator's are all satisfactorily maintained.*[8-10]
8. The method is very easy to teach and even school children can grasp the technique after a few demonstrations.
9. The method can be used in patients with chest wounds and also in a confined space.

DISADVANTAGES

The main objections are as follows:[11]

1. Reluctance to breathe into an apnoeic person owing to fear of infection or contamination. If we agree that this is the most effective way of saving a life then this fear should be ignored. In cases of aesthetic objections, a handkerchief or a cloth may be placed over the victim's nose or mouth. This in no way detracts from the efficiency of the method.
2. Cases of dizziness have been reported following on the hyperventilation which accompanies this technique at the commencement, but this disappears very quickly when the number of inflations is reduced.
3. The unwillingness of volunteers to allow themselves to be used as teaching material. With the use of the manikin to be described later this objection falls away.
4. There is a risk of over-distention of the lungs, especially in infants and children; but if one watches the movement of the chest and, when inflating infants, only uses short puffs of air, this danger becomes minimal.

INDICATIONS

Oral resuscitation is recommended as the method of choice to be applied by First Aid personnel on all unconscious and apnoeic patients. The method is particularly useful in subjects suffering from respiratory failure as a result of drowning, electric shock, shock from lightning, smothering, choking, smoke suffocation, overdosage of drugs, carbon monoxide and other gas poisonings, head or chest injuries, and heart attack or stroke.[12]

The *contra-indications* to this method are few and may be listed as unconsciousness due to insecticides or overdosage from corrosive poisons, and patients suffering from fracture of the cervical vertebrae.

COMPARISON OF ORAL METHOD WITH MANUAL METHODS OF ARTIFICIAL RESPIRATION

Gordon *et al.* did a series of well-controlled experiments on paralysed and apnoeic infants, small children and adults, in order to compare the efficiency of the manual methods with that of the oral methods.[13]

The manual methods evaluated in infants were the 3 push-pull methods:

Back-pressure arm-lift;
Back-pressure hip-lift; and
Chest-pressure arm-lift (Sylvester).

Their studies conclusively proved the undoubted superiority of the mouth-to-mouth method of resuscitation over the manual methods, especially in cases where no endotracheal tubes were used to ensure a free airway.

These studies were also continued in adults.[13] Push-pull manual methods were compared with the oral methods. Three push-pull methods were studied:

Back-pressure arm-lift (Holger Nielsen);
Back-pressure hip-lift; and
Chest-pressure arm-lift (Sylvester).

The final results were more or less similar to those in infants and children. When an endotracheal tube was inserted, the amount of ventilation was about the same for all methods. However, when the nose clip or mouth piece was substituted for the endotracheal tube, the results with manual ventilation were entirely

TABLE 1: MEAN PULMONARY VENTILATION DURING ARTIFICIAL RESPIRATION ON 8 APNOEIC NORMAL ADULT MALE SUBJECTS[13]

Method	*Cuffed Endotracheal Tube, (Respiratory Cycle in c.c.)*	*Mouthpiece & Noseclip*	
		(Respiratory Cycle in c.c.)	*Cases Actually Ventilated*
Normal resting tidal volume	540	—	—
Mouth-to-mouth	1,020	910	100
Sylvester	920	450	50
Back-pressure arm-lift	950	580	62.5
Back-pressure hip-lift	1,090	650	75

unsatisfactory. Now only 50-75% of the subjects were ventilated with the manual methods, whereas other subjects were adequately ventilated with mouth-to-mouth insufflation.[13]

Recently Safar[14] also measured the tidal volumes obtained during the back-pressure, arm-lift (Holger Nielsen) and the chest-pressure, arm-lift method (Sylvester) on 29 curarized, anaesthetized and apnoeic volunteers. With the conventional back-pressure, arm-lift method, without an artificial airway, the average tidal volume varied from zero to less than dead space air in 12 of the 15 subjects investigated. This failure was chiefly due to the relaxed tongue which obstructed the pharynx due to flexion of the neck. When the head was tilted backwards the obstruction was reduced and increased tidal volumes were obtained.

The results were slightly better with the Sylvester method and the best results were obtained with the Sylvester-Brosch method.

As only border-line tidal volumes were obtained with these methods in *healthy adults*, Safar expresses grave doubts about the desirability of teaching these methods in future, 'for in actual asphyxiated victims partial airway obstruction due to mucus, foam, vomitus, blood or other foreign matter may require higher inflation pressures than the normal methods provided.'[14] Even in cases where the natural airway is open, the rescuer has no means of ascertaining whether air does, in fact, pass into the lungs.

These results were confirmed by independent workers in Britain and the U.S.A.[15]

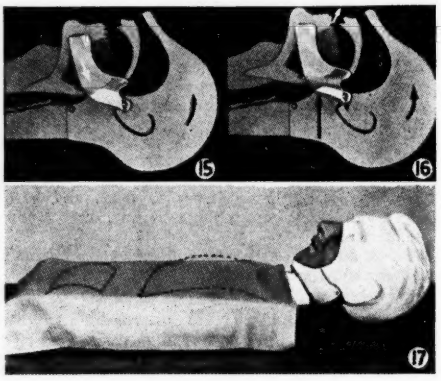
With such convincing scientific evidence before us it would appear as if the manual methods of artificial respiration are effective only:

1. When the subject has an endotracheal tube; but this cannot be inserted by a layman.
2. When another helper is present to ensure a free airway. However, such helpers are not always available in acute emergencies.

TRAINING AIDS

Training aids are now available for demonstrating mouth-to-mouth and mouth-to-nose insufflation. These (Figs. 15-18) consist of the sectional head-model and the Ambu manikin.[16]

It is recommended that ambulance drivers and First Aid teams train in pairs and go through all the movements on themselves, viz. positioning of the patient, clearing of the mouth, tilting of the head and simultaneous pulling of the chin. All that the manikin should be used for is to demonstrate the position of the relaxed jaw in the unconscious patient, and the movements of the chest when the head of the manikin is in the correct position. The manikin will also overcome the prejudice people may have of practising on a conscious subject, and obviate the danger of cross-infection.



Films and film strips demonstrating the oral techniques are also available, but these are not yet available with a South African background. In order to stimulate interest in this method, our Department has just completed a colour-sound film which runs for about 10 minutes and which will be suitable for exhibition to schools and First Aid organizations.

Last month 2 lives were apparently saved in Pretoria by laymen who had only witnessed one demonstration on a manikin and seen a film demonstrating this technique.

The *Pretoria News* of 28 April 1961, reported:

'Prompt mouth-to-mouth respiration by a trainee fireman, Mr. F. van Heerden, to-day saved the life

of a Native man who had been taken for dead in Scheiding Street, Pretoria.

An elated Mr. P. F. Davey, the Chief Fire Officer, told a representative of the *Pretoria News* of the incident, which he described as a " magnificent act."

Mr. van Heerden, who joined the Fire Brigade only recently, went to the railway station to book a seat. Strolling back to the Fire Station he came across a group of onlookers gathered round a Native man lying on the pavement.

The Native's face was covered with a jacket. Mr. van Heerden was told that the Native was dead and that an ambulance had been sent for.

' Mr. van Heerden quickly whipped off the jacket, pulled out the man's tongue and applied oral respiration—which he had seen for the first time in a film shown a week ago,' Mr. Davey said.

RECOVERED

' On the 26th application the Native began to breathe and then he recovered. But for Mr. van Heerden's swift action the man would have died, as the brain can only function for 3 minutes without oxygen.

What is even more amazing is that Mr. van Heerden has not yet taken his First Aid test,' Mr. Davey added.

After his harrowing experience Mr. van Heerden walked back to the fire station and asked for Sal Volatile. An eye-witness told Mr. Davey of Mr. van Heerden's dramatic life-saving action.

The St. John Ambulance Brigade District Surgeon hailed the news as " thrilling."

Last Saturday, a St. John Ambulance driver, Mr. Ret Nortje, applied oral respiration for the first time in the history of Pretoria and saved the life of the daughter of the Rev. de Wet Strauss, of the Groot Kerk, Pretoria.

He had seen the First Aid method illustrated for the first time in the film seen by Mr. van Heerden.

Mr. Davey said that hundreds of lives could possibly be saved by using oral respiration.'

With all this evidence before us there can be no doubt that the oral method of artificial respiration is by far the most effective, and also the easiest to teach.

Now that the manikins are available, the aesthetic objections in the teaching of this method fall away.

This technique should get first place in all First Aid Manuals and the manual methods should only be recommended when the method introduced by Elisha is contra-indicated.

Oral resuscitation is recommended as the method of choice by the following organizations in America:[7]

American National Red Cross.
American Medical Association, Council on Medical Physics.
American Society of Anesthesiologists.
Empire State Rescue and First Aid Association.
Medical Society of the State of New York.
National Academy of Sciences—National Research Council.
New York State Department of Health.
New York State Society of Anesthesiologists.
Surgeon General, Department of the Army.

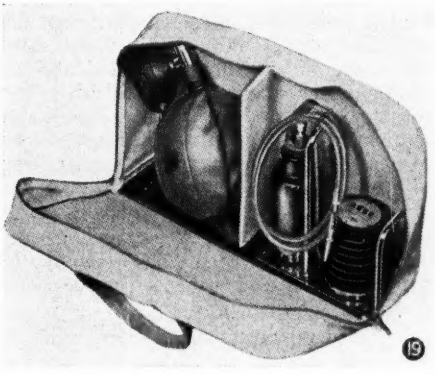
It has also been accepted as first choice in Denmark, Switzerland, New Zealand, Austria, Germany and the USSR.[3]

MECHANICAL AIDS IN ARTIFICIAL RESPIRATION

For the medical practitioner and, perhaps, for the professional rescuer, there are now mechanical aids available to assist them in applying positive pressure respiration. As an anaesthetist one thinks at once of the Magill attachment on the Boyle's anaesthetic machine. Even the simple anaesthetic mask is very useful when no other apparatus is available.

Other simple devices like the Safar or S-shaped airway (already described) and the Brook airway[17] are useful adjuncts, but those devices are not recommended for use by inexperienced laymen.

A useful apparatus which should be immediately available in every ambulance, dentist's room, casualty department and hospital ward is the *Ambu-resuscitator*.[18] This apparatus consists of a bag lined with foam rubber, a Ruben non-return valve, and a tight fitting mask. The Ambu-resuscitator will produce up to 50 litres of air per minute and, where indicated, may be connected to a supply of oxygen.



Where no suction is available the *Ambu-suction pump*,[18] which is supplied in a compact plastic bag, together with the Ambu-resuscitator, is a life-saving apparatus, and it should be an essential piece of equipment in every ambulance, factory and First Aid Station. The effective use of both these aids will certainly save lives (Fig. 19, reproduced here

with acknowledgments to *Testa-Laboratorium*, Copenhagen, Report No. 3, 2nd ed., August 1958).

CLOSED CHEST CARDIAC MASSAGE *

In 1960 Kouwenhoven and his co-workers from Baltimore, USA, announced a new method of cardiac massage in cases of cardiac arrest without the need of having to open the thorax.[19] Since the publication of their original article, in July last year, this method has been critically evaluated in various medical journals.

History. The idea of improving the circulation by external pressure on the thorax is not new. In 1878 Boehm, whilst doing experiments on cats, grasped the chest in his hands and applied rhythmic pressure on the area of greatest expansion. In a large series of cases his results were very encouraging.[20]

Tournade and his associates reported in 1934 that in experimental cardiac arrest in dogs, compression of the thorax of the dog would produce blood pressures varying from 60 to 100 mm. Hg.[21]

Experimental Work. In 1951 Kouwenhoven and his associates at the Johns Hopkins University, Baltimore, commenced a study of closed chest methods of stimulating the heart electrically in cases of ventricular fibrillation. They selected dogs as their experimental animals because the reaction of the dog's heart to electric currents is more or less similar to that of the human heart. They found that if one could stimulate the dog's heart within 2 minutes of the onset of ventricular fibrillation, the survival rate was very high. In cases where ventricular fibrillation had lasted for longer than 2 minutes, defibrillation was still possible; but in most cases the dogs developed cardiac standstill and death unless the chest was opened and the heart massaged manually.

They also quote 2 cases of successful defibrillation, with the use of an external defibrillator, in cardiac patients who developed ventricular fibrillation.[22]

In the development of this new technique of cardiac massage the Baltimore team used over 100 dogs for their experiments. They tested various methods of external cardiac massage which would maintain the circulation without the necessity of opening the chest. Eventually a safe and effective technique was developed by means of which they could ensure an adequate circulation for periods lasting up to 30 minutes in dogs suffering from ventricular fibrillation.

The fibrillation was stopped by an electric shock with the aid of an external defibrillator.[19]

In another series of experiments 2 Baltimore anaesthetists, Redding and Cozine, made a comparative experimental study of the open-chest and closed-chest methods of cardiac massage in dogs.

It is often difficult to differentiate *true* cardiac arrest from severe hypotension without doing a diagnostic thoracotomy. They therefore decided to compare these methods only on dogs which were already suffering from artificially induced ventricular fibrillation.

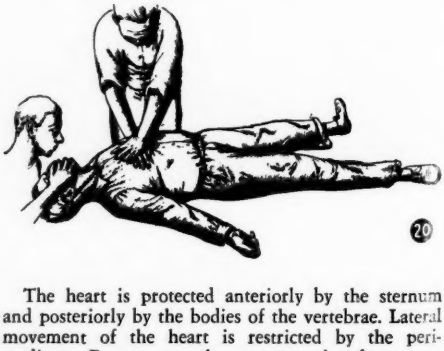
Their results proved that both methods were equally effective. It would, however, be very difficult, if not impossible, to repeat these experiments on human guinea-pigs.

They also cautioned against the use of maximal force in an attempt to maintain the blood pressure at a high level during actual massage. Mediastinal haemorrhage, fractured ribs and laceration of the liver were reported. To avoid these complications they recommend that only moderate force should be used.[23]

PRACTICAL APPLICATION OF EXPERIMENTAL WORK

Following up their experiments, Kouwenhoven and his associates developed a successful method of external cardiac massage in human beings.

To understand the principle of this method one should consider the anatomy of the thoracic cage and its contents.



The heart is protected anteriorly by the sternum and posteriorly by the bodies of the vertebrae. Lateral movement of the heart is restricted by the pericardium. Pressure on the sternum, therefore, compresses the heart between it and the spine and

* A film on *External Cardiac Massage* is now available to the medical profession. It may be obtained on loan from Smith, Kline and French Laboratories (Pty.) Ltd., P.O. Box 38, Isando, Transvaal.

forces blood out. Reversal of the procedure allows the heart to refill with blood.

The practical application of this method is shown in Fig. 20.

METHOD

Place the patient on his back, preferably on a firm support.

The heel of the one hand with the other on top of it is placed on the sternum just above the xiphoid process.

Now apply firm pressure vertically downwards at least 50 times per minute. At the end of each manoeuvre the hands are lifted slightly in order to allow full expansion of the chest.

The operator should place himself in a position which will allow him to use his bodyweight when applying pressure. The pressure should be of sufficient force to move the sternum 3 or 4 cm. towards the vertebral column.[19]

One should always bear in mind that maintaining the circulation without adequate oxygenation of the blood, is worse than useless. A second assistant should, therefore, be at the head of the patient and perform oral resuscitation or mechanical inflation of the lungs with oxygen.

A convenient method is to inflate the lungs once and watch the chest rise. This is followed by 4 sternal compressions and each manoeuvre is repeated at the rate of about one manoeuvre per second. This will provide about 12 inflations per minute and 48 sternal compressions per minute. By doing both manoeuvres simultaneously one would not be in a position to see the chest expand or get a warning of any obstruction of the airway.

External cardiac massage by itself does not ensure sufficient inflation as less than dead space air is moved. When only one person is present he should, therefore, endeavour to do both manoeuvres alternately.

The efficiency of this method has apparently been amply demonstrated at the Johns Hopkins Hospital, Baltimore. It was originally felt that this technique would only be useful in children because the ribs are flexible, but patients up to 80 years of age suffering from cardiac arrest have been successfully resuscitated.

A revival rate of 14 out of 20 successful external massages is claimed.[19] The duration of the massage varied from under one minute to 65 minutes. In those cases where records of blood pressures were kept, systolic pressures ranging from 60 to 100 mm. Hg were recorded. Three of the 20 patients treated were in ventricular fibrillation and all were successfully defibrillated by means of a closed-chest AC defibrillator.

INDICATIONS FOR USE OF CLOSED CHEST METHOD

There is no doubt that the ideal treatment of a cardiac arrest is still a diagnostic thoracotomy followed by manual massage of the heart and defibrillation where indicated.[24]

We are apt to forget that, when in doubt, a thoracotomy should be regarded merely as a diagnostic procedure. The only instrument required for this operation is a scalpel. The diagnosis of *true* cardiac arrest is made as soon as the skin is incised. Should there be bleeding from the skin incision it is a sign that the heart is still beating, albeit feebly, and the operation need not be proceeded with. One should now consider efforts to improve the circulation and here external cardiac massage would prove very valuable.

When a heart stops during an operation or during the administration of an anaesthetic, a thoracotomy and manual massage are still the methods of choice. One may, however, attempt this new method for 30 seconds only whilst waiting for the surgeon to go into the chest. If one carries on much longer, valuable and essential time is wasted.

Another factor is that, unless one actually has an electrocardiograph going at the time of arrest, it is impossible to differentiate a cardiac standstill from a ventricular fibrillation. The only other way to determine the actual cause of the arrest is by means of a thoracotomy. Not many Mine Native Hospitals have the luxury of routine electrocardiograms during surgical operations.

When this acute emergency occurs outside the operating theatre, the correct treatment is more difficult to decide upon. In such cases one should be guided by the equipment available for resuscitation, the age of the patient, the actual lesion preceding the arrest and the experience of the operator. Perhaps the best advice would be to do mouth-to-nose breathing and external cardiac massage and send for an experienced surgeon. In any case such a course of action could do very little harm and would be preferable to one of masterly inactivity. Should the patient survive, the danger of sepsis and a collapsed lung following on thoracotomy is also avoided.

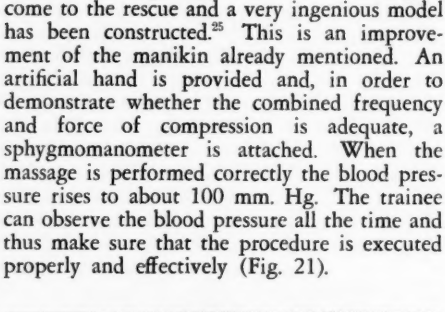
This should be the method of choice in doctors' and dentists' consulting rooms, accidents on the roads, in mines, and at work. In cases of coronary thrombosis on the golf course, for example, this technique should certainly

be employed together with oral resuscitation until the ambulance arrives.

In medical emergencies as opposed to surgical emergencies (where one would previously have grabbed a syringe filled with the proverbial coramine), one should now apply firm pressure on the sternum and get oxygen into the lungs as rapidly as possible.

AIDS TO TEACHING METHODS

Like the oral methods of resuscitation, the effective teaching of this method presents a certain amount of difficulty. Ambu-International of Copenhagen has, however, again come to the rescue and a very ingenious model has been constructed.[25] This is an improvement of the manikin already mentioned. An artificial hand is provided and, in order to demonstrate whether the combined frequency and force of compression is adequate, a sphygmomanometer is attached. When the massage is performed correctly the blood pressure rises to about 100 mm. Hg. The trainee can observe the blood pressure all the time and thus make sure that the procedure is executed properly and effectively (Fig. 21).



The teaching of both these new methods of resuscitation are to be recommended to Mine Medical Officers and also First Aid Personnel. These techniques should be given the widest publicity and their universal adoption by rescue teams will certainly save lives in future.

I wish to thank the Editor of the *Proceedings of the Mine Medical Officers Association* for permission to submit this paper for publication in this journal.

I should also like to thank African Oxygen Limited for the loan of the Ambu-Manikin, Sectional Head, Ambu Respirator and Suction Apparatus which were demonstrated at the meeting and also for permission to illustrate these devices in my publication.

Figs. 1-13 are reproduced from a pamphlet issued by the National Water Safety Council, New Zealand.

Figs. 20 and 21 are reproduced with acknowledgments to *Ambu-International,* Report No. 7E.

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MEDICAL GERONTOLOGY

PHYSICAL AND MENTAL DECLINE IN OLD AGE

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Johannesburg

Physical and mental decline have been accepted generally as part of the natural process of growing old. These reductions of functional and reserve capacities do not occur simultaneously or at the same rate in the different organs of the body; they are therefore manifest in various ways. Not all functions show decrement with age in the same individual.[1]

Many of the changes of senescence are obvious. The facial features of the subject are often used as a measure of these changes. Greying of the hair and the character of the skin are considered with the changes in the proportions of the facial profile for this assessment. The changes are often minimal. There is a tendency toward an increased thickness of the nasal tip, a decrease in thickness of the upper lip with some inversion due to the loss of teeth and alveolar absorption, a decreased palpebral fissure and an increased size of the eyelids and the ear lobes. There is also a change of proportion resulting from loss or wearing down of the teeth. In a brief moment of observation these features may be correlated to estimate the individual's age.

In the same way an old adult is distinguished from a young adult just as the cat from the kitten. A rapid correlation of size, bodily proportion, behaviour and mannerisms, is made for this assessment. The age of a person crossing the street may well be judged at a glance.

There is a definite deterioration in physical strength and ability after maturity. Numerous studies have been done to demonstrate the various facets, particularly with reference to the working capacity of the older person; but many factors such as motivation, occupation, state of training and differences in bodily build were unfortunately not considered in the earlier group studies.

In 1836 Quetelet[2] showed (by means of spring coil dynamometers) that the maximum back muscle strength was attained at the age of 27 years, after which it dropped to 82% at 50 years. Rejs[3] found that the maximum strength was maintained for several years until 37, to decline to 92% at the age of 50 years. He also showed that the strength of the back muscles drops faster with age than the strength of the arm and hand muscles. The average grip that can be maintained showed a proportional decline with age which was nearly identical with that of the maximum grip.[4]

The decline in the maximum strength and capacity for continued maximal exertion may be the limiting factor in heavy work and energetic pursuits. This decrease of the maximum capacity for hard work is more pronounced than the decline of muscle strength. Long-distance runners often come from the older age groups, even as old as the forties. Here the performances depends less upon this capacity for peak output for short periods.

Individual differences increase with age when the performance is measured.[5] Reaction time is a measure of peripheral sensory processes, perception, translation into action and the response. Changes in performance may involve any part of this chain of mechanisms and their limitations. Classical reaction times show little change of speed or accuracy with age.[5, 6] Changes are shown up, however, when complicated procedures, such as continuous coordinated movements, or intervening activities, are introduced. More striking are the changes in the way the more complicated tasks are done. The older person tends to shift from speed to accuracy of action.[7]

An excellent example of a complex skill which involves factors other than strength and reaction time, is driving a motor car. Three of its essential elements are steering coordination, braking reaction time, and sensitivity to glare. McFarland *et al.*[8] have done a comprehensive study of professional truck drivers in highway transportation and their problems. Truck driving is generally considered an occupation for the younger man.

The group studied showed a median age of 35 to 40 years, with half the drivers within 5 or 6 years on either side of this. The range was 21 years to over 60 years. Most of them had had many years' experience. The findings are summed up as follows:

'Wisdom, judgment, caution, and such overall driving characteristics may compensate for, or make

* Honorary Physician to the Witwatersrand Jewish Aged Home, and the Aged Homes of the Rand Aid Association.

less important, the losses in speed and precision which go with age. This compensation is not complete, however, in view of the types of emergency situation which drivers have to face.'

They also found significant support for the notion that older truck drivers are safer on the highway than are younger ones, when all conditions of operation are equal. Known physiological and psychological changes associated with age are related to the expected decline in vocational competence of older drivers. Many points for study as regards adaptation of the job to the worker and also retirement programmes are raised, together with their implications of benefit for both employer and the drivers.

Norris and Shock[9] compared the work output to the apparent metabolic cost expenditure of exercise performed. They used this as a measure of mechanical efficiency. The 4 variables were the rate of movement, duration of work, rate of work and total amount of work done. They used manual cranking of an electrodynamic brake ergometer. The older subjects (80-90 years) were found to be less efficient than the younger subjects only at the highest and lowest rates of work performed. The most probable explanation of these differences was thought to be poorer coordination of the older subjects.

The interpretation of all these findings for the individual and the employment of the older worker, is a large task on its own. The effects of ageing vary so much from individual to individual that functional rather than chronological age would be a more effective criterion in judging physical abilities; but measurement of functional age has not yet been standardized.

Changes in psychomotor skill suggest that older persons should not do work requiring continuous rapid action. This loss of speed, however, tends to be compensated for by greater accuracy and attention to detail. Older workers tend to gravitate away from jobs requiring rapid judgments or movements during limited time intervals, as well as from night driving and lifting heavy cargo. Changes in visual and auditory functions, though less significant than frequently supposed, are most likely to cause deterioration in performance.

Vision. Visual acuity shows a widespread decrease with age.[10, 11] To some extent these changes are due to a clouding of the cornea, lens or media, refractory errors, retinal changes and reduction in pupil size, which are all common in the older age groups.[12, 13]

Regardless of the amount of illumination, visual performance decreased with age. Weston[14] demonstrated this in the same individuals on re-testing after a period of 5 years. The decline was sharper under conditions of low illumination. The older subjects improved with extra-illumination, but not to the level of the younger group. The greater drops in acuity are seen when smaller test objects are used.

Gilbert[15] showed, by means of Colour Aptitude Tests, a decline with age from 20 years onward. The effect of practice on maintenance of efficiency was not assessed.

Mann and Sharpley[16] showed a progressive lessening of the limits of peripheral vision at low illumination and after dark adaptation. One estimate was made by McFarland and Fisher[17] that for every 13 years of age beyond 20, the threshold intensity of illumination must be doubled to be seen by the dark-adapted subject.

The impairment of visual function with increasing age is not very marked on the whole. The effects of this decrement can often be ameliorated by proper attention to the findings of the authors in this field. Much can be achieved by wearing corrective lenses, and well-directed, proper illumination free from glare. Optical aids to increase the perceived size of the object may be used. The contrast and the reflective properties of colours may be employed effectively in the surroundings to improve perception.

Hearing. Auditory changes with increasing age are characterized by the gradual loss of high frequency acuity. It is rarely noticed by the individual until it is quite marked and interferes with the upper frequencies of speech. The thresholds for both air and bone conductions also rise. The degree and the incidence of hearing loss are somewhat greater in males than in females.[18] Hearing aids which amplify the higher frequencies may enable the older person to participate in conversations normally.

It is not clear how much is due to peripheral or central change in the ear and its connexions. Noise of high intensity can produce permanent adverse effects in the higher tonal levels.[19] There is no assessment of how much this contributes to the normal auditory impairment associated with senescence.

All other sensory modalities show changes of varying degree with senescence. Howell[20] found that 24% of 200 healthy old Chelsea pensioners had impairment of one kind or another. The forearms and the shins are the usual sites of change. The changes of such functions as smell, taste, vibration and pain are usually of little practical significance.

Learning, Memory and Intelligence. The function of memory consists of 3 successive stages: learning, retention and recall. Intelligence can be considered as the ability to learn and to solve the tasks and problems required.

Many investigations, each using different test methods and different groups of subjects, have been carried out. The descriptive terms used and the methods of analysis of the results are often not uniform. The part played by factors such as physical decline, decreased motivation and interfering habits, which are common in the older age group, have not been fully assessed. The indications, however, are that there is an impairment of the measured actual and potential ability to learn.

Jones[21] states that there is a significant decline of mental performance not accounted for by factors of speed, vision or hearing. He came to this conclusion after reconsidering the findings of his previous study in 1928, in the light of more recent work and criticism by colleagues. The age changes tend to be greater in the tests which directly show the functioning of current abilities rather than the effects of earlier learning. This may not apply to adults gifted by education and social standards.[22]

Gilbert[23] studied 2 groups of younger and older persons who were matched to eliminate educational factors. Significant differences in memory were found.

'Retention of paired associates is one of the tests on which older persons show greatest decline. We see that not only is the formation of entirely new associates harder for older than for younger persons, but the retention of these associations is even more difficult.'

There is a slighter greater loss for retention than for immediate recall, particularly if the presentation is short. That the more intelligent retain their abilities more effectively as they grow older, was also found.

Kay's experiments[24] excluded as far as possible the factors of time and speed. He viewed similar findings differently.

'The adult's deficiencies here primarily arise not because any retaining mechanism is functioning inadequately but, rather the reverse, it is holding on too indelibly to what it already holds and is not sufficiently flexible to cope with new data.'

He places the fault with old habits (which prevent acquisition of new memories) and not a mental decline. He feels that subsequent training may restore this ability.

The conclusions of Lorge[25] are even more striking and interesting. He states that intelligence was maintained in the same individual without significant diminution.

'For the same individuals there would be little if any loss, on the average, through the fifties and the sixties.'

He feels that the cross-sectional studies are biased in their estimate of the course of intellectual growth, maintenance and decline. They do not correct adequately for the differential education attainments of young and old adults. The old adults are penalized by speed on the present intelligence tests.

Loss of memory for recent events (often cited as a severe handicap in old age) may not be due to a fault of retention. It is probably due to a reduced ability to form and integrate new facts and thoughts. An additional problem arises from the numerous interfering factors of past learning, lack of motivation and physical illness.

The extensive list of features indicating both physical and mental decline of old age is whittled down considerably when studied more closely. The former outlook may be considered narrow and restricted because it is not often that one can separate these features completely from pathological processes. But this outlook opens new fields for thought and work, as the diseases are gradually becoming understood. The outlook for those growing older becomes, therefore, more optimistic with the control of these disease entities.

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THE NUTRITIONAL STATUS OF INFANTS WITH HYPERTONIC DEHYDRATION*

PART 1

SOLOMON E. LEVIN, M.B., B.Ch., M.R.C.P.E., D.C.H.

and

D. SLONE, M.B., B.Ch. (W'RAND).

Department of Paediatrics, Baragwanath Hospital and University of the Witwatersrand, Johannesburg

Hypertonic dehydration (the hyperosmolarity syndrome) is a variant of water and electrolyte disturbance characterized by predominant water depletion. It may occur as a complication of gastroenteritis. The incidence, suggestive clinical features and characteristic biochemical findings have been reviewed in 2 previous communications.[1,2] Briefly, the condition may be suspected in the presence of a combination of acidotic respiration (hyperpnoea), minimal clinical signs of dehydration, pyrexia, oliguria and some disturbance of the central nervous system. Serum electrolyte estimations reveal a hypernatraemia and hyperchloraemia. Other biochemical findings are a raised blood urea level and a diminished carbon dioxide combining power. The serum potassium level may be elevated, normal or low.

In our previous study[2] we stressed that 9 of 11 infants with hypertonic dehydration were relatively well nourished. This was in striking contrast to the majority of infants with diarrhoeal dehydration, admitted to the wards, who were found to be poorly nourished.

This paper confirms, in a larger series of infants studied, that hypertonic dehydration rarely occurs in the malnourished child. The possible reasons for this observation are considered. Furthermore, the prognostic significance of the state of nutrition in hypertonic dehydration is presented.

MATERIAL AND METHODS

Of the 50 children in this series, 11 have been reported on previously.[2] The other 39 cases were admitted to the Paediatric Wards of Baragwanath Hospital during the 6-month period October 1958 to March 1959. These children fulfilled the clinical and biochemical criteria of hypertonic dehydration as outlined by us.[2]

The state of nutrition of our patients was assessed both clinically and by body weight. A child was considered to be malnourished if several of the following stigmata were found:

1. Sparse, straight, depigmented hair.
2. An acute nutritional dermatosis.
3. Nutritional oedema.
4. A body weight below 60% of that expected for the age.

* Paper read by Dr. D. Slone at the *Symposium on Parenteral Fluid Therapy* held in Johannesburg on 29 October 1960.

Where possible the body weight after rehydration was noted. In the case of those infants who died, the maximum body weight during the hospital stay was considered. In the absence of normal weight standards for African children, we have compared the weights of our patients with the weights of normal American children.[3]

(A recent study by Kahn and Freedman[4] of the weights of a small group of privileged African children suggest that this comparison with American norms is justifiable in assessing the state of nutrition).

The children were assigned to 3 groups as follows:

Group A: Clinical state of nutrition fair to good with body weights above the third percentile.

Group B: Body weights below the third percentile with no overt stigmata of kwashiorkor.

Group C: Clinical evidence of protein malnutrition with body weights well below the third percentile.

RESULTS

An analysis of the nutritional status and mortality rate in the 50 patients is shown in Table 1.

TABLE 1: NUTRITIONAL STATE AND MORTALITY RATE IN 50 CASES OF HYPERTONIC DEHYDRATION

Group A Nutrition: Fair to Excellent	*Group B Underweight: No Overt Signs of Malnutrition*	*Group C Severe (Kwashiorkor) Malnutrition*
*31 (62%)	11 (22%)	8 (16%)
Deaths 3 (9.7%)	Deaths 3 (27%)	Deaths 6 (75%)

*Includes 3 infants, under 1 year of age, who were premature by weight at birth and whose clinical state of nutrition was fair to good, but whose body weights fell below the third percentile.

There were 31 (62%) infants in group A. This included 3 infants whose weights fell just below the third percentile. These children were born prematurely and their clinical state of nutrition was regarded as fair to good, despite a low body weight. There were 11 (22%) infants who fell in to group B, while the remaining 8 (16%) cases, all with stigmata of protein malnutrition (kwashiorkor) were included in group C.

There were 12 deaths among the 50 patients (mortality rate: 24%). However, in group A only 3 of 31 infants died (mortality: 9.7%), whereas in group C there were 6 fatalities among 8 children (mortality: 75%). Group B infants occupied an intermediate position with a mortality rate of 27%.

DISCUSSION

Kahn[5] observed at this Hospital that about 88% of infants with summer diarrhoea, admitted to the wards, showed signs of malnutrition. Most of these infants were severely dehydrated. In a later study of 100 consecutive cases of kwashiorkor, Kahn[6] showed that in clinically dehydrated cases the serum sodium level was often below 130 mEq. per litre. In none of the cases was the serum sodium level above 138 mEq. per litre. Thus diarrhoeal disorders in kwashiorkor commonly result in hypotonic dehydration. This observation has been confirmed elsewhere.[7]

From our study of hypertonic dehydration it can be seen that 62% of the 50 infants were regarded as being fairly well nourished, and of the remaining 22 cases only 8 (16%) showed evidence of severe malnutrition. This confirms our initial impression that hypertonic dehydration is commonly associated with a good nutritional state and that it is rarely found in children with overt signs of protein malnutrition.

The reason for the rarity of hypertonic dehydration in kwashiorkor appears to lie in the abnormal body fluid distribution in these children, which lessens the chances of development of hypertonic dehydration.

Smith[8] estimated the total body water in malnourished children and found it to be increased from the average normal of 62.5% to 84.5% of the body weight. This increase in total body water was present in oedematous as well as in marasmic infants without clinical evidence of oedema. Compared with normal infants of the same weight, the total body solids were reduced, these being replaced by water. The site of increase in body water was not localized. Workers in Mexico[7] performed tissue biopsies (skin and muscle) on cases of malnutrition, some of whom developed diarrhoea and dehydration. They found an increase in the total content of intracellular water, even in the clinically dehydrated cases. The sodium and chloride content of the cells was increased and the potassium content was below normal. These recent findings and those of previous studies on malnourished children which showed an increase in the extracellular volume of fluid,[9] indicate that the malnourished child has increased intracellular and

extracellular water (Fig. 1). Thus a malnourished child would be less likely to develop hypertonic dehydration in a situation of predominant water depletion. An increase in the osmolarity of the extracellular fluid would in fact tend to correct the chronic state of cellular overhydration. We suggest that this excess of body water accounts for the low incidence of hypertonic dehydration in kwashiorkor.

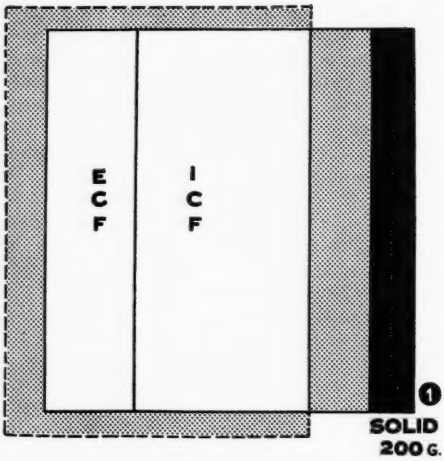

Fig. I. Body fluid compartments of a 4 Kg. child with kwashiorkor.
The stippled area represents increased body water.
Tissue solids (in black) are reduced to 20% of normal, i.e. 200 g. instead of 1 Kg.
ECF: Extracellular Fluid;
ICF: Intracellular Fluid.

If hypertonic dehydration supervenes in a malnourished child it indicates a water depletion of considerably greater magnitude than in a well nourished child with the same degree of biochemical disturbance. This probably accounts for the high mortality of hypertonic dehydration in malnourished children revealed in this study.

SUMMARY

1. The nutritional status of patients developing hypertonic dehydration is analysed.

2. A previous observation that hypertonic dehydration rarely occurs in malnourished infants is confirmed.

3. The abnormal distribution of water and electrolytes in kwashiorkor is reviewed and it is suggested that the increase in total body water decreases the likelihood that hypertonic dehydration will supervene in these patients.

4. The prognosis of hypertonic dehydration is related to the state of nutrition; being poor in the malnourished child.

We thank Dr. I. Frack, Superintendent, Baragwanath Hospital, for permission to submit this paper for publication and Drs. E. Kahn and S. Wayburne for facilities to study cases under their care.

We are indebted to the South African Institute for Medical Research for the electrolyte estimations and the Photographic Unit, Department of Medicine, University of the Witwatersrand for Fig. I.

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NOTES AND NEWS : BERIGTE

Dr. B. C. Uys, M.B., B.Ch. (Rand), M.R.C.O.G., has commenced practice as a specialist Obstetrician and Gynaecologist at 705 Medical Arts Building, 220 Jeppe Street, Johannesburg. (*Telephone*: — *Rooms*: 22-9368).

* * *

The telephone number of Mr. Joseph Lannon, F.R.C.S. has been printed incorrectly in the new issue of the Johannesburg telephone directory. His number remains unaltered, viz. 42-3429.

* * *

It is with regret that we learn that Dr. Cyril Ross, of Pretoria, who is visiting post-graduate dermatological clinics in England and Israel, has suffered a coronary thrombosis. He has been admitted to the London Clinic. It is unlikely that he will return to South Africa before the end of September.

* * *

Dr. Louis F. Freed, M.A. (S.A.), M.D. (Rand), D.Phil. (Pret.), D.Phil. (O.F.S.), D.P.M., F.R.S.S.Af., was recently invited to serve as the First Honorary Visiting Lecturer in the Faculty of Social Science of the University of the Orange Free State.

Earlier this year he addressed the Annual Conference of Medical Students of the University of Pretoria on the theme *The Role of the Social and Sociological Forces within the Human Continuum in the Production of the Stress Situation.*

Dr. Freed was recently made a Member of the New York Academy of Science for his contributions to the advancement of science.

MEDICAL COLOUR TELEVISION PROGRAMME

THE SMITH KLINE AND FRENCH UNIT

Programme in South Africa

1. At the New Science Lecture Theatre, University of Cape Town.

MONDAY, 25 SEPTEMBER, 1961

12.30 p.m. *Repair of Ventricular Septal Defect Using the Heart-Lung Machine in Conjunction with Profound Hypothermia.*

Surgeon Dr. C. N. Barnard.
Anaesthetist Dr. J. Ozinsky.
Panel Dr. V. Schrire (*Chairman*), Prof. A. J. Brink, Dr. A. B. Bull, Mr. P. E. Marchand.
Moderator Mr. J. C. van der Spuy.

4.00 p.m. *Paediatric Programme Presented by Dr. J. D. L. Hansen.*

1. Problems of Nutrition in the Pre-School Child.
2. Management of Prematurity in Hospital and at Home.
3. Practical Procedures in Paediatrics.
4. Respiratory Emergencies.
5. Treatment of Burns.
6. Can You Recognize these Typical Syndromes?

Participants Dr. J. D. L. Hansen (*Chairman*).
Prof. F. J. Ford, Dr. I. Robertson,
Dr. W. H. Opie, Mr. R. van der Riet,
Dr. L. Keet, Dr. H. de V. Heese,
Dr. R. McDonald, Miss A. Moodie,
Dr. P. Smythe, Dr. S. Mannion,
Dr. A. B. Bull.
Moderator Dr. R. F. Maggs.

26 SEPTEMBER, 1961.

4.00 p.m. *Radical Mastectomy.*

Surgeon Prof. J. H. Louw.
Anaesthetist Dr. W. v.d. M. Lambrechts.
Panel Mr. G. Sacks (*Chairman*), Dr. T. Fichardt, Prof. D. S. Chapman, Mr. J. Wolfowitz.
Pathologist Dr. C. J. Uys.
Moderator Mr. R. D. H. Baigrie.

27 SEPTEMBER, 1961.

4.00 nm. *Gastrektomie.*

Chirurg Dr. B. J. van R. Dreyer.
Narkotiseur Dr. P. A. Foster.
Paneel Dr. E. B. Malherbe (*Voorsitter*), Prof. C. H. Derksen, Dr. D. G. le Roux.
Moderator Dr. P. S. Willers.

28 SEPTEMBER, 1961.

2.00 p.m. *Vaginal Hysterectomy.*

Surgeon Prof. J. T. Louw.
Anaesthetist Dr. J. C. Woeke.
Panel Dr. R. Theron (*Chairman*), Dr. P. J. H. Massey, Dr. T. St. V. W. Buss, Dr. F. N. Neser.
Moderator Dr. J. P. Roux.

4.00 nm. (*a*) *Totale Abdominale Histerektomie.*

Chirurg Prof. J. N. de Villiers.
Narkotiseur Dr. C. G. du Plessis.
(*b*) *Lower Segment Caesarean Section with Demonstration of Resuscitation of Infant.*
Surgeon Dr. P. F. M. du Toit.
Anaesthetist Dr. R. D. Allan.
Paediatrician Dr. R. F. Maggs.
Panel. Paneel Dr. F. Daubenton (*Voorsitter: Chairman*), Dr. P. Connan, Dr. R. W. A. Nel, Dr. P. V. Suckling.
Moderator Prof. F. Geldenhuys.

29 SEPTEMBER, 1961.

12.30 p.m. *Cholecystectomy.*

Surgeon Mr. R. L. Forsyth.
Anaesthetist Dr. T. J. V. Voss.
Panel Prof. F. D. du T. van Zijl (*Chairman*), Mr. J. Lannon, Dr. L. Werbeloff, Mr. W. G. Schulze.
Moderator Mr. J. Heselson.

4.00 p.m. (*a*) *Demonstration of Ambulant Treatment of Varicose Ulceration.*
(*b*) *Radical Varicose Vein Operation.*

Surgeon Dr. J. J. W. van Zijl.
Anaesthetist Dr. M. J. Louw.
Panel Mr. W. Wilkie (*Chairman*), Dr. J. K. Bremer, Mr. W. Girdwood, Mr. J. M. Hoffman.
Moderator Dr. J. S. Visser.

2. At the University of Witwatersrand Great Hall, Johannesburg.

9 OCTOBER, 1961.

8 p.m. *Plastic Surgery:* Repair of Cleft Lip.

Surgeon Mr. S. Hersch.
Panel Mr. D. Walker, Dr. Gavron, Prof. Lester Brown, A Speech Therapist.
Moderator Prof. Dreyer.

9.00 p.m. *Orthopaedic Surgery:* Hip Arthroplasty.

Surgeon Mr. J. Edelstein.
Assistants Mr. J. Craig, Mr. H. Klein, Mr. R. Douglas.
Panel Mr. C. Moller, Mr. S. Sacks, Mr. C. Morris.
Moderator Mr. M. Lunz.

11 OCTOBER, 1961

8.00 p.m. *Gynaecology:* The Use of Abdominal Decompression.

Operator Dr. John M. Samson.
Assistant Mr. S. A. C. Graham.
Panel Prof. O. S. Heyns, Dr. W. A. B. Roberts, Dr. M. Bloom.
Moderator Dr. F. Daubenton.

9.00 p.m. *Urology:* Total Cystectomy with Ileal Bladder Formation.

Surgeon Mr. J. C. Jordaan.
Panel Mr. E. Widrich, Mr. E. Lipworth, Mr. C. Kisner.
Moderator Dr. R. Schach.

12 OCTOBER, 1961.

8 p.m. *Cardiac Surgery:* Open Heart Operation.
Surgeon Mr. P. Marchand.
Assistants Mr. L. du Plessis, Mr. J. J. Brossy, Dr. R. Sacchi.
Physicians Dr. W. Scott, Dr. H. Goldman, Dr. S. Zwi.
Anaesthetist Dr. J. Pitcher.
Panel Dr. B. van Lingen (*Chairman*), Dr. J. Barlow, Dr. M. Zion, Mr. D. Fuller, Mr. E. Joubert.
Moderators Mr. L. Fatti, Dr. L. Braudo.

9.15 p.m. *Neuro-Psychiatry:* The Application of Sociodrama in the Treatment of the Psychologically Ill, with Clinical Demonstration.
Panel Dr. B. Benjamin (*Chairman*), Mrs. Lambert, Dr. A. Lazarus, Dr. L. Isserow.
Moderator Dr. K. H. Barnes.

13 OCTOBER, 1961.

8 p.m. *Paediatric Surgery:* Undescended Testis.
Surgeon Mr. W. Trubshaw.
Panel Mr. J. Lannon, Dr. S. Lopis, Dr. S. Heymann.
Moderator Mr. W. Kark.

9.00 p.m. *General Surgery:* Operation for Duodenal Ulcer.
Surgeon Prof. D. J. du Plessis.
Panel Mr. M. Tucker (*Chairman*), Prof. G. Elliott, Dr. J. Kaye, Mr. J. A. Myburgh.
Moderator Mr. J. Wolfowitz.

3. At the University of Natal Medical School, Durban.

MONDAY, 23 OCTOBER, 1961.

8.00 p.m. *The Diagnosis of Visible Lumps.*
Moderator Prof. D. S. Chapman.
Surgeons Mr. E. M. Barker, Mr. J. R. Boulle, Mr. R. O. Wise.
Panel Mr. R. Leonard, Mr. A. Beiles, Mr. A. D. Cuthbert.

Patients will be demonstrated to illustrate the diagnosis of visible masses of surgical importance particularly referring to the skin, breast, neck and thyroid gland.

9.00 p.m. *The Treatment of Tuberculous Joints—The Charnley Arthrodesis for the Knee.*
Moderator Mr. F. J. Hedden.
Surgeon Mr. J. D. Raftery.
Anaesthetist Dr. G. L. Were.
Panel Dr. B. A. Dormer, Dr. M. Findlay, Mr. C. J. Kaplan.

The diagnosis and modern treatment of tuberculosis of bones and joints will be discussed.

There will be visual presentation of a Charnley compression arthrodesis of a tuberculous knee joint.

X-ray examination and specimens illustrating the pathological lesions will be shown.

TUESDAY, 24 OCTOBER, 1961.

5.00 p.m. *The Treatment of Genital Prolapse.*
Moderator Prof. Derk Crichton.
Surgeon/Gynaecologist Mr. S. Sacks.
Anaesthetist Dr. S. Price.
Panel Miss L. Raftery, Mr. H. M. Pretorius, Mr. M. M. Baskin, Mr. E. L. Trott.

There will be a discussion on the appropriate treatment of a series of patients suffering from a variety of herniae of the female genital tract (prolapse) and a demonstration of an operative repair.

8.00 p.m. *An Operation for Hernia.*
Moderator Mr. A. Radford.
Surgeon Mr. S. Movsas.
Anaesthetist Dr. R. J. H. Tapson.
Panel Mr. I. Goldberg, Mr. G. Kane, Mr. L. Linder.

There will be a visual presentation of the anatomy of inguinal and femoral herniae. Patients will be shown to illustrate the differential diagnosis.

An operation will be performed to show a method of access and repair.

9.00 p.m. *Demonstration of Local Anaesthesia Techniques.*
Moderator Prof. H. Grant-Whyte.
Anaesthetists Dr. G. L. Were, Dr. R. J. H. Tapson, Dr. R. A. Findlay, Dr. I. C. Kotzen.
Panel Dr. A. A. Cilliers, Dr. H. M. Curwen, Dr. K. H. Foord, Dr. O. Schmahmann.

A variety of local anaesthetic techniques will be shown with particular reference to the relief of pain and the treatment of limb injuries. Included will be brachial plexus and local nerve blocks and caudal analgesia.

WEDNESDAY, 25 OCTOBER, 1961.

8.00 p.m. *Transventricular Mitral Commissurotomy.*
Moderator Dr. M. Berger.
Surgeon Mr. I. Barnat.
Anaesthetist Dr. K. Ezekowitz.
Panel Dr. J. K. Drummond, Prof. J. V. O. Reid, Dr. T. Armstrong, Mr. P. Stemmler.

A case of mitral stenosis will be shown with discussion of investigations, diagnosis and indications for operation.

A recording of the heart sounds will be transmitted and electrocardiographic findings will be demonstrated.

X-ray examinations and specimens illustrating the pathological lesions in the heart will be shown.

The operative technique used for dividing the mitral valve by the transventricular route will be shown.

9.00 p.m. *The Treatment of Some Common Ano-recta Conditions.*
Moderator Mr. A. Copley.
Surgeon Prof. D. S. Chapman.
Anaesthetist Dr. P. R. Mesham.
Panel Mr. N. Butcher, Mr. A. Lurie, Mr. M. Stein, Mr. J. Kirstein.

Some common ano-rectal conditions will be demonstrated and the methods of examination and investigation shown.

Sigmoidoscopy and rectal biopsy techniques will be shown.

Operative procedures will include those of haemorrhoids, fissure-in-ano and ischiorectal abscess.

THURSDAY, 26 OCTOBER, 1961.

5.00 p.m. *A Paediatric Demonstration.*
Moderator Prof. H. L. Wallace.
Panel Dr. N. Mann, Dr. F. Walt, Dr. P. Klenerman, Dr. B. Edge.

A number of children will be shown to demonstrate aspects of disease as seen at King Edward VIII Hospital.

The technique of scalp vein infusion and other procedures will be shown.

5.30 p.m. *A Dermatological Demonstration.*

Moderator Dr. M. D. Messent.
Panel Dr. J. A. L. Leeming (*Chairman*), Dr. S. H. Fine, Dr. J. Walker, Dr. V. Faktor.

Cases shown with discussion of their diagnosis and treatment will include lupus vulgaris, leprosy, porphyria and the mycoses.

A technique of skin biopsy using the high speed rotary punch will be shown.

A method of direct microscopic examination for fungus using skin scrapings will also be demonstrated.

8.00 p.m. *Anaesthesia and Operative Techniques in Minor Gynaecological Surgery.*

Moderator Mr. N. G. Steere.
Surgeon/Gynaecologists Prof. Derk Crichton, Mr. T. P. Boulle.
Anaesthetists Prof. H. Grant-Whyte, Dr. P. R. Mesham.
Panel Mr. G. B. Batchelor, Mr. D. K. Quinlan, Mr. R. P. C. Perrot, Dr. M. G. H. Mayat.

A series of patients will be shown demonstrating common examples of female pelvic pathology.

A demonstration of minor pelvic operative procedures will follow together with a demonstration of anaesthetic techniques for such operations.

FRIDAY, 27 OCTOBER, 1961.

8.00 p.m. *The Treatment of Femoral Neck Fracture—Arthroplasty by the Thompson Prosthesis.*

Moderator Mr. C. J. Kaplan.
Surgeon Mr. F. J. Hedden.
Anaesthetist Dr. C. M. Sliom.
Panel Mr. J. G. Bickerton, Mr. J. F. P. Mullins, Dr. R. J. P. Venning.

The types of fractured neck of femur, their complications and treatment will be discussed.

X-ray examinations and pathological specimens will be shown.

The operative technique of the replacement of a fractured head of femur by means of a Thompson prosthesis will be demonstrated.

9.00 p.m. *Lower Segment Caesarean Section and Resuscitation of the Newborn.*

Moderator Prof. Derk Crichton.
Surgeon/Gynaecologist Mr. B. C. Murless.
Anaesthetist Dr. G. W. Barwise.
Infant Resuscitation Dr. B. Jackson.
Panel Mr. D. F. Standing, Mr. H. J. C. de Villiers, Mr. M. A. Renton, Mr. N. F. Walker.

There will be a demonstration of a technique of intraperitoneal lower segment Caesarean section and resuscitation of the newborn babe with accompanying panel discussion of features of special interest.

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ELI LILLY MEDICAL RESEARCH FELLOWSHIPS

A group of physicians from 11 countries paid a 3-day visit recently to the pharmaceutical laboratories of Eli Lilly and Company in Indianapolis, U.S.A.

The physicians, who are all participants in the Lilly International Medical Fellowship Programme, are spending one year of post-graduate study in leading hospitals and universities in the United States. They come from Argentina, Australia, Brazil, Colombia, England, Italy, Mexico, the Philippines, El Salvador, South Africa and Sweden.

The visitors toured Lilly's research laboratories and production departments, the clinical research laboratory at Marion County General Hospital, and the Company's biological and agricultural laboratories at Greenfield, Indiana. They also saw films on antibiotic production and research.

The International Medical Fellowships are awarded annually to help improve public health, stimulate medical research and raise standards of medical teaching. A total of 122 physicians from 30 nations have been granted fellowships since the programme began 16 years ago Each Fellow is chosen for the award by leading members of the medical profession in his own country.

ELI LILLY MEDICAL RESEARCH FELLOWSHIP (SOUTH AFRICA)

Dr. Robert Kamener, *South Africa* (centre, rear), watches a member of the Lilly research staff at work at the console of the nuclear magnetic resonance apparatus while visiting the pharmaceutical laboratories of Eli Lilly and Company at Indianapolis, U.S.A.

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Petersen Limited, the sole agents for Beecham Research Laboratories Ltd., in the Republic of South Africa, South West Africa, the British Protectorates, and the Central African Federation, have received a small initial quantity of Penbritin (BRL. 1341).

At present the amount of this compound which is available in Johannesburg is insufficient for general distribution, even to hospitals. Until the position improves, this material will be issued only for the treatment of urgent cases.

Trade announcements will be made in due course.

Enquiries should be addressed to:

Petersen Limited, P.O. Box 5785, Johannesburg.

PREPARATIONS AND APPLIANCES

THE GIBBS SOLEUS ERGOMETER

Medical Distributors (Pty.) Ltd., of Johannesburg and Cape Town, now present the **Gibbs Soleus Ergometer** to the medical profession.

The **Soleus Ergometer** consists of a vertically mounted, rubber padded platform with a curved heel support. The platform is pivoted at the base, so that it may rotate through an angle of 25° when the foot is plantar flexed. The midpoint of the platform is fixed to a spring with adjustable tension, which is compressed during active plantar flexion of the feet. Each complete traverse of the platform produced by plantar flexion is recorded on a meter. If the traverse is incomplete, the meter does not record. A spring adjustment provides for resistance to plantar flexion to be varied as required.

The instrument is mounted on an adjustable carriage which can be fixed to the bed frame, and the position of the **Ergometer** in the bed can thus be readily altered. A curved hoop is attached to the carriage to raise the bed clothes and allow free use of the apparatus. When the instrument is not in active use, it does not impede free movement of the lower limbs in bed.

The **Soleus Ergometer** records only full contractions of the soleus muscle against an adjustable resistance. This is accompanied by synergic contraction of the dorsiflexor muscles of the leg and the extensor and flexor muscles of the knee joint. If the movement of plantar flexion of the foot is incomplete, the meter does not record. Thus, the accurate control of exercise performed by the soleus and thigh muscles, which are responsible for the venous return from the lower limbs, may be achieved.

The use of the **Ergometer** is of particular value in the treatment of long term medical cases. The problem of preventing venous stasis in these cases is generally less difficult, and adequate use of the **Ergometer** should provide against venous thrombosis. It is recognised that disability suffered by some patients, may preclude the sufficient use of the apparatus. The reading of the recorder should be noted routinely with the temperature, pulse and respiration, and patients who fail to undertake adequate basal exercise, should be singled out for special attention by the medical and nursing staff.

Other applications include rehabilitation following fractures of the leg, orthopaedic operations and diseases of the nervous system.

For further particulars and an illustrated brochure on this new type of equipment please write to the *Sole Distributors for South Africa:*

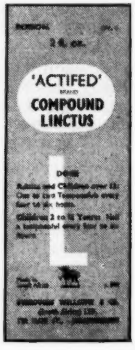
Medical Distributors (Pty.) Ltd., P.O. Box 3378, Johannesburg, or P.O. Box 195, Cape Town.

ACTIFED COMPOUND LINCTUS FOR RELIEF OF COUGHS

Burroughs Wellcome & Co. (S.A.) Ltd., announce the introduction of **Actifed** Compound Linctus for the routine relief of coughs.

Actifed Compound Linctus contains 1 mg. Triprolidine Hydrochloride (Actidil), 20 mg. Pseudoephedrine Hydrochloride, and 7.5 mg. Codeine Phosphate and Syrup Base to 1 fluid drachm (3.5 c.c. approx.)

Actidil is the most potent and safe antihistamine.



It promotes decongestion by its antiallergic action. Pseudoephedrine, when given orally, has a marked vasoconstrictor effect which provides nasal and bronchial decongestion; it is also an effective bronchodilator. The combined effect is to promote ventilation of the respiratory tract, diminish post-nasal drip, and to allow drainage and expectoration of secretions. In addition, Codeine Phosphate acts as the antitussive in this combination to diminish useless coughing.

Indications: For the relief of cough especially associated with congestion of mucous membranes of the respiratory tract in both adults and children. It is inadvisable for children under the age of 2 years.

Side Effects: Although pseudoephedrine causes virtually no pressor effect in patients with normal blood pressure, **Actifed** Compound Linctus should be used with caution in the presence of cardiovascular symptoms.

Presentation: **Actifed** Compound Linctus is available in 2 fl. oz. bottles and 20 fl. oz. bottles.

Price to Public: 2 fl. oz. R0.55. 20 fl. oz. R5.00.

Dosage: For Adults and Children over 12 Years of Age:

1 to 2 teaspoonfuls every 4—6 hours.

For Children 2—12 years of Age:

Half a teaspoonful every 4—6 hours.

Further information may be obtained from: Burroughs Wellcome & Co. (South Africa) Ltd., P.O. Box 10293, Johannesburg.

CORRESPONDENCE

EFFECTIVE DISTRIBUTION TO MEDICAL PRACTITIONERS

To the Editor: When individuals or organizations make use of the Medical Association of South Africa to distribute notices or pamphlets, are these notices or pamphlets sent to all doctors or only to the sixty per cent (60%) who are members of the Medical Association of South Africa?

As an example, did the *Directory of Members for* 1961 just issued by the S.A. Society of Physiotherapy reach *all* doctors, or merely the members of the Medical Association of South Africa?

No Directory